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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,883	12/13/2001	Robert K. Chen	Chen 10-13-24	9054

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MENDELSON AND ASSOCIATES PC
1515 MARKET STREET
SUITE 715
PHILADELPHIA, PA 19102

EXAMINER

BRINEY III, WALTER F

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/017,883

Applicant(s)

CHEN ET AL.

Examiner

Walter F Briney III

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 23 and 25 is/are rejected.
- 7) ☒ Claim(s) 21, 22, 24 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings were received on 2 April 2004. These drawings are accepted by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-11, 13-20, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snow (US Patent 6,418,221) in view of Stewart (US Patent 3,855,431).

Claim 1 is limited to **an interface circuit for interfacing between a pair of subscriber tip/ring lines and a central office of a telecommunications network**. Snow discloses both a high and low-pass filter (i.e. **filter circuitry**) (figure 4, elements 106 and 109) that separate POTS and DSL signals (i.e. **configured to separate low-frequency and high-frequency signals**) on tip and ring lines (i.e. **appearing on the tip/ring lines**) (figure 4, elements 10 and 11). Snow discloses a high-pass filter (i.e. **filter circuitry**) with a **blocking** capacitor (figure 4, element 106) that inherently **affects the low-frequency impedance of the tip/ring lines**. Snow discloses a hybrid and CODEC designed for (i.e. **high-frequency interface circuitry configured to**

process...) (figure 4, elements 107 and 108) DSL signals (i.e. **the high-frequency signals**). Snow discloses a **SLIC** and **CODEC** designed for (i.e. **and low-frequency interface circuitry configured to process...**) (figure 4, elements 103 and 105) POTS signals (i.e. **the low-frequency signals**). Therefore, Snow discloses all limitations of the claim with the exception of **an impedance warping circuit configured between the SLIC and the CODEC**. Stewart teaches balancing the impedance between a subscriber line and terminal circuitry thus canceling unwanted signals (column 1, lines 26-65). Stewart's method of impedance matching provides amplification free from oscillation while using only two amplifiers (column 1, lines 57-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to balance the impedance between a line and termination as taught by Stewart, where the line and impedance represent the POTS lines and SLIC/CODEC of Snow, for the purpose of removing unwanted signals. Stewart teaches an impedance matching circuit (i.e. **IWC**) that inherently compensates for any load on the tip and ring lines, including the blocking capacitor of the high-pass filter (i.e. **wherein the IWC tends to compensate for the effect of the blocking capacitor on the low-frequency impedance between the tip/ring lines**). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claim 2 is limited to **the invention of claim 1**, as covered by Snow in view of Stewart. Stewart teaches an impedance matching circuit that balances the impedance between a line and a termination point to remove unwanted signals (i.e. **wherein the compensation provided by the IWC provides a desired impedance between the**

tip/ring lines for both the low-frequency and high-frequency signals). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claim 4 is limited to **the invention of claim 1**, as covered by Snow in view of Stewart. Snow discloses DSL signals (i.e. **wherein the high-frequency signals correspond to DSL signals...**) that are **greater than about 4 kHz** and POTS signals (i.e. **the low-frequency signals correspond to POTS signals...**) that are **less than about 4 kHz** (column 1, lines 18-24). Snow discloses splitting the signals with a **high-pass filter configured to provide the DSL signals to the high-frequency interface circuitry and a low-pass filter configured to provide the POTS signals to the low-frequency interface circuitry** (column 4, lines 3-12). Snow discloses a **high-pass filter with a blocking capacitor** (figure 4, element 106). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claim 5 is limited to **the invention of claim 1**, as covered by Snow in view of Stewart. Stewart teaches an impedance matching circuit (i.e. **IWC**) (figure 1) that is coupled to a first differential transformer (i.e. **the SLIC**) that receives signals from the tip and ring lines (i.e. **is configured to receive a first differential signal from the SLIC**) and a second differential transformer that receives signals from the CODEC (i.e. **and a second differential signal from the CODEC**). The impedance matching circuit outputs a differential signal to the first transformer (i.e. **and generate a third differential signal provided to the SLIC**) (column 2, lines 16-44). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claim 6 is limited to **the invention of claim 5**, as covered by Snow in view of Stewart. Stewart teaches a **first amplifier** (figure 1, element A2) that generates an **output** based in part on the signal received from the second differential transformer (i.e. **configured to generate a first single-ended output signal based on the second differential output signal**) (figure 1, element T2). Stewart teaches a **second amplifier** (figure 1, element A1) that generates an **output** based on the signal received from the first differential transformer (i.e. **configured to generate a second single-ended output signal based on the first differential output signal**) (figure 1, element T1). The output of the second amplifier is coupled to the first amplifier and the output of the first amplifier generates the signal applied to the first differential transformer (i.e. **wherein the first and second single-ended output signals are used to generate the third differential output signal**). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claim 7 is limited to **the invention of claim 6**, as covered by Snow in view of Stewart. Stewart teaches a **first operational amplifier** (figure 1, element A2) that inverts a portion of the differential signal from the speech path (i.e. **configured as an inverter**) and a **second operational amplifier** (figure 1, element A1) that inverts a portion of the differential signal from the trunk. Stewart teaches a band-pass circuit connected between the output and input of the second amplifier (figure 2, element A21) (i.e. **as a frequency-dependent inverter**) (column 3, lines 19-24). The signal applied to the transformer T1 (i.e. **the third differential output signal...**) will **increase** in frequency when the POTS signal (i.e. **the low-frequency signals**) from the speech

path **increases** in frequency. Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claim 8 is limited to **the invention of claim 7**, as covered by Snow in view of Stewart. Stewart teaches a band-pass circuit connected between the **output and inverting input** of the **second amplifier** (figure 1, element A1). The band-pass circuit includes a **resistor and capacitor in parallel** (figure 2, element A21).

Claim 9 is limited to **the invention of claim 6**, as covered by Snow in view of Stewart. Stewart teaches a first transformer (i.e. **an output filter**) (figure 1, element T1) that filters the **single-ended output** of the **first amplifier** (figure 1, elements A2). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claims 10, 11, and 13-18 are essentially the same as claim 1, 2, and 4-9, respectively, and are rejected for the same reasons.

Claim 19 is limited to **the invention of claim 1**, as covered by Snow in view of Stewart. Snow in view of Stewart teaches a SLIC (Snow, figure 4, element 103) with a hybrid amplifier used for matching the termination impedance (i.e. **synthesized impedance between tip and ring lines**) to the line impedance (i.e. **desired impedance**) (Stewart, figure 3, LINE END). Snow discloses a **blocking capacitor** (Snow, figure 4, element 106) that is in parallel with the termination of the SLIC, therefore, it will inherently **impede the impedance synthesis by causing an effective impedance between the tip and ring lines to deviate from the desired impedance**. Stewart teaches that the hybrid amplifier balances the impedance between the line and the termination (column 1, lines 27-65) such that all elements effecting the termination

will be accounted for, including the blocking capacitor (i.e. **and the IWC is adapted to reduce the impedance deviation caused by the blocking capacitor**). Therefore, Snow in view of Stewart makes obvious all limitations of the claim.

Claims 20, 23 and 25 are essentially the same as claim 19 and are rejected for the same reasons.

Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snow in view of Stewart and further in view of Junek (US Patent 3,867,589).

Claim 3 is limited to **the invention of claim 2**, as covered by Snow in view of Stewart. Junek teaches matching impedances on a telephone network to a standard of **900 ohms** in series with **2.16 microfarads** (column 3, lines 6-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the standard 900 ohms and 2.16 microfarads as taught by Junek to balance the impedance of the tip/ring pair and the POTS circuitry.

Claim 12 is essentially the same as claim 3 and is rejected for the same reasons.

Allowable Subject Matter

Claims 21, 22, 24, and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 21 is limited to **the invention of claim 1**, as covered by Snow in view of Stewart. Stewart discloses an IWC that includes a **first** and **second differential port**. Stewart discloses receiving a line signal (i.e. **IWC is configured to receive a first**

differential signal from the SLIC at the first differential port) and provide an output to a trunk line (i.e. **and a second differential signal from the CODEC a the second differential port**). Stewart also discloses that the hybrid amplifier performs 2-4-wire conversion (Stewart, column 4, lines 23-27), however, this results in a third port connected to the CODEC instead of being connected to the SLIC. Therefore, Snow in view of Stewart makes obvious all limitations of the claim with the exception of **a third differential signal provided to the SLIC at the third differential port**. Thus, claim 21 is allowable.

Claims 22, 24, and 26 are essentially the same as claim 21 and are allowable for the same reasons.

Response to Arguments

Applicant's arguments with respect to claims 1-18, filed 2 April 2004, have been fully considered but they are not persuasive.

With respect to claim 1, the applicant alleges that the combination of Snow and Stewart is improper (amendment, page 7, third paragraph); the examiner respectfully disagrees. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Snow does not

explicitly disclose providing impedance matching, but does disclose a SLIC (Snow figure 3, element 103). A SLIC is a common telecommunications device characterized by the acronym BORSCHT (i.e. Battery, Overvoltage, Ringing, Supervisory, CODEC, Hybrid, and Testing). The hybrid function inherently requires providing matching termination impedance as well as the 2-4-wire conversion present in most telephone terminal systems. Because Snow does not explicitly disclose this circuitry, one of ordinary skill in the art would have been required to find a teaching present at the time of the invention. Stewart teaches a device for balancing a line to a terminating impedance (column 4, lines 23-27); figure 3 illustrates a subscriber line (Stewart, figure 3, LINE END), and even though it is not pictured, the trunk side transformer is actually a four-wire connection to the CODEC. The trunk correlates to the CODEC (Snow, figure 3, element 105) of Snow and the subscriber line correlates to the tip and ring signals (Snow, figure 3, elements 12 and 13). In the very least, the teaching of Stewart would have provided the hybrid portion of the SLIC by splitting the incoming voice signal into two directions and by balancing each line for the purpose of reducing unwanted signals (Stewart, column 1, lines 56-65).

In response to applicant's argument that the references fail to show certain features of applicant's invention (amendment, page 7, paragraph 4), it is noted that the features upon which applicant relies (i.e., **reducing impedance deviation between the tip and ring lines from a desired impedance**) are not recited in the rejected claim(s), 1-18. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26

USPQ2d 1057 (Fed. Cir. 1993). Furthermore, claims 1 and 10 recite the limitation **“an impedance warping circuit (IWC) configured between the SLIC and the CODEC, wherein the IWC tends to compensate for the effect of the blocking capacitor on the low-frequency impedance between the tip/ring lines.”** The examiner maintains that the hybrid amplifier as taught by Stewart correlates to the IWC, that the necessity of hybrid functionality in the SLIC of Snow requires the placement between the SLIC and CODEC, and that the IWC’s function is to balance the impedance of the tip and ring lines to the termination impedance for the purpose of eliminating echoes. Therefore, any components connected on either line that effect the termination impedance (i.e. **the blocking capacitor**) will inherently be compensated for.

Finally, the applicant alleges that the teaching of Stewart has been mischaracterized, and that the only purpose of Stewart is for the hybrid amplifier to maintain stability (amendment, page 7, paragraph 4); the examiner respectfully disagrees. In particular, the examiner notes that the hybrid amplifier is recited to provide amplification free from oscillation, however, this is an achievement of providing the correct matching impedances for each line.

With respect to claim 10, the rejection is maintained for the arguments presented with respect to claim 1.

With respect to claims 2-18, all rejections are maintained in view of the rejections presented with respect to claim 1 and 10.

With respect to claims 5-9 and 14-18, the amendments are noted by the examiner as being only for the purpose of clarity and do not introduce any new limitations.

Claims 19, 20, 23, and 25 present several new limitations, however, the examiner maintains that the prior art teaches these limitations. In particular, when the hybrid amplifier as taught by Stewart is reconfigured to perform the hybrid function of Snow, it is noted that it is responsible for providing termination to the tip and ring signals (figure 3, elements 12 and 13) (i.e. **the SLIC and the CODEC are adapted to synthesize a desired impedance between the tip and ring lines**). The similar input structure of Snow and the applicant suggest that any effects caused by the blocking capacitor (figure 4, element 106) (i.e. **the blocking capacitor impedes the impedance synthesis by causing an effective impedance between the tip and ring lines to deviate from the desired impedance**) as disclosed by the applicant will also occur in Snow. Therefore, the blocking capacitor will effect the termination of Snow, and the hybrid amplifier of Stewart will correct the problem (i.e. **the IWC is adapted to reduce the impedance deviation caused by the blocking capacitor**). The formal rejections of these claims is presented in the preceding section.

Claims 21, 22, 24, and 26 are considered to be allowable matter, however, are objected to because they are written in dependent form, the formal responses are presented in the preceding section.

No new grounds of rejection were presented in view of claims 1-18.

The new grounds of rejection presented in claims 19, 20, 23, and 25 were necessitated by amendment.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

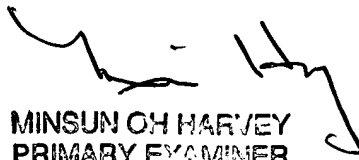
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F Briney III whose telephone number is 703-305-0347. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER